REMARKS

Claims 1-21 are active. Claims 1-7, 9-11, 14-18 and 20-21 are rejected under 35 USC 102 as being anticipated by Hayashi. Claims 8, 12, 13 and 19 are rejected under 35 USC 103 as being unpatentable over Hayashi in view of Antoniadis ('017).

Amended claims 1-21 are submitted for the Examiner's reconsideration.

Certain of the claims are amended in the interest of clarity and consistency and to improve their form. No new matter is introduced.

Amended claim 1 is believed unobvious over Hayashi much less not anticipated by this reference for the following reasons. This claim structure is foreign to Hayashi and the remaining references cited of record. This claim calls for:

> A circuit board arrangement for an organic electronic device, comprising:
>
> a circuit board having a surface on which a plurality of electrically interconnected electrical devices are disposed;
>
> at least one of the electrical devices comprises an active organic electronic component electrically integrated on the substrate surface with others of the interconnected devices to form at least a portion of an electrical circuit, the organic electronic component having at least one electrode layer;
>
> the at least one electrode layer of the integrated active organic electronic component forming a conductive track layer on the surface for a non–orqanic semiconductor electrical component.

As to the structure:

> a circuit board having a surface on which a plurality of electrically interconnected electrical devices are disposed

Hayashi ¶ 0117 is cited for disclosing a substrate. However, amended claim calls for a circuit board having a surface on which a plurality of electrical devices are disposed. Hayashi ¶ 0117 refers to Figs. 1E and 1F. No circuit board is disclosed in these figures or any other figure of Hayashi and having a surface on which a plurality of electrically interconnected electrical devices are disposed. There are two laminated layers shown in these figures, and others of the figures such as Figs. 1A-1F for example. The laminated layers include a base layer 11, a display layer 12 and an electric layer 14 in Fig. 1A and a display layer 12 and an electric layer 14 in Figs. 1E and 1F. These layers are laminated and stacked one over the other and do not suggest a circuit board as claimed. The display layer and the electric layer are interconnected by conductive vias 37 which are oriented normal relative to the layers. This laminated structure is not reasonably construed as a circuit board. Circuit boards do not comprise laminated layers as disclosed, but rather a single insulating substrate on which interconnected printed circuits and electrical devices are mounted.

A circuit board is defined as

> "an insulated board on which interconnected circuits and components such as microchips are mounted or etched"

American Heritage Dictionary of the English Language, Fourth Edition, 2000, Houghton Mifflin Company (yourdictionary.com). The laminated multilayer structure as described in Figs. 1E and 1F is not such a circuit board. Typically a circuit board is a flat single layer of material.

In Figs. 1A – 1B, a multilayer stacked structure is also disclosed comprising a display layer 12, a base 11, and an electric layer 14, layers 12 and 14 being on opposite surfaces of the base 11. These layers do not form a circuit board as claimed. The electric layer 14 is stated to comprise a power source, a drive circuit, a control circuit, a communication circuit and an acoustic conversion element. ¶0083. These elements are chips ICs (integrated circuits) (see ¶0238-0246) and do not include an active organic component as claimed as discussed below in connection with Fig. 17A and the accompanying text, which describes such chips in further detail and which chips do not comprise organic components. The display layer and the electric layer 14 being laminated are not the same as, or suggests the claimed circuit board of claim 1.

However, claim 1 further calls for:

> at least one of the electrical devices comprises an active organic electronic component electrically integrated on the substrate surface with others of the interconnected devices to form at least a portion of an electrical circuit, the organic electronic component having at least one electrode layer;
>
> the <u>at least one electrode layer of the integrated active organic electronic component forming a conductive track layer on the surface for an in organic semiconductor electrical component</u>. (underlining added)

This structure is different than that which is disclosed in Hayashi. The disclosed electric layer is described in ¶0083 only in general terms and is not specifically described as to the construction details and connection of the recited electrical components and elements. However, examples of such details are given in connection with Fig. 17A discussed below. ¶ 0152 refers to Fig. 3D wherein a semiconductor chip

16s is referred to, but this is a conventional silicon chip, i.e., an integrated circuit (IC), and is not organic as it is described as not flexible. The patent states in this section: "it is difficult to request the semiconductor chip to have flexibility," ¶ 0152, lines 5-6. This chip (IC) is indicated to be a conventional integrated circuit chip which is typically silicon as known in this art (a rigid material) and is not a circuit board as claimed. Such chips may be mounted on a circuit board, but themselves do not form a circuit board as understood by one of ordinary skill in this art.

Fig. 3D, and ¶0149, shows and describe an insulator layer 16d and a wiring pattern 16w (reference numeral missing in figure). No active organic electronic component is shown on the layer 16d. The wiring is cited as being organic, but only in the context of a passive element. The semiconductor chip 16s is not flexible as described above and thus no conclusion can be drawn as to it being organic. Fig. 3C is stated to comprise a plurality of laminated electric layers including an insulating layer 16d. A plurality of laminated electric layers do not form a circuit board as discussed above. Wiring 16a and 16b is shown in Fig. 3C. An electrical contact hole 16f is shown. This structure is not disclosed as a circuit board as claimed. The chip 16s (Fig. 3D) which is mounted on the layer 16d of Fig. 3C is not an organic component.

Fig. 4E shows a power source 27, a driver circuit 28 and a communication circuit 29 on the same electric layer, see ¶0154. Again, see the discussion below in connection with Fig. 17A wherein these elements, power source 27 and driver circuit 28 are described as conventional ICs and not organic devices. However these circuits are

not described in further detail in paragraph ¶0154 nor is their interconnection described. None of the elements power source 27, driver circuit 28 and communication circuit 29 are described as an organic component as claimed, but rather as inorganic chips.

Fig. 4F shows repetitive electric layers 30 including units 30x which is a driver circuit, an IC. Each unit, ¶0150, may have a laminated structure of a plurality of laminated layers. This structure is not a circuit board. The driver is an IC as described in connection with Fig. 17A as noted above and below herein.

Fig. 4C shows a transistor in an electric layer ¶0147. The transistor is for forming a circuit in an electric layer. The transistor comprises an organic conductive layer 31 covered with a layer 32 on which are electrodes 33 and 34. An organic semiconductor layer 35 covers the electrodes 33 and 34. The layer 35 is protected with a film 36. No circuit board is disclosed in this figure nor is the interconnection of the transistor of Fig. 4C with other elements on a circuit board as claimed shown or described in this reference. The attachment of this transistor to other electric layers of the reference disclosure is not relevant as all such layers are disclosed as laminated layer of a multilayer structure, which does not form a circuit board as claimed.

Claim 1 amended further calls for

> at least one electrode layer of the integrated active organic electronic component forming a conductive track layer on the surface for a inorganic semiconductor electrical component

Neither ¶0147 nor Fig. 4C shows or suggests this structure, i.e., there is no at least one electrode layer of the active organic electronic component that forms a

conductive track on the claimed circuit board surface for an inorganic semiconductor component as claimed. This structure requires the organic component to have a conductive track layer on the surface for an inorganic semiconductor electrical component. This structure is missing in Hayashi. Applicants have carefully reviewed this reference and find no other component disclosed or described that suggests this structure, notwithstanding no such circuit board is disclosed.

The Action refers to ¶0149 as disclosing organic wiring in the embodiment of Fig. 3C. No inorganic semiconductor component, however, is disclosed in Fig. 3C or this paragraph or anywhere else in this reference. Therefore, claim 1 is not suggested by the Fig. 4C embodiment or other disclosed embodiments. The Fig. 4C embodiment also does not show or suggest the claimed circuit board. None of the embodiments described above herein or in this reference disclose the claim 1 circuit board.

The embodiment of Fig. 4E is not disclosed as a circuit board, but only as a form of the electric layer such as layer 14, Figs. 1A-1F, ¶0154, with the circuits 27, 28 and 29 on this layer. However, the only figure that further describes the circuits 27, 28 and 29 in detail is shown in Fig. 17A. ¶0245 describes the driver circuit 842 of Fig. 17A as an IC 842 (integrated circuit), which, as discussed above in connection with Fig. 3D describing an IC chip 16s, is not an organic device, and is described as not flexible and thus implied as being silicon. Fig. 17A describes a control IC 843, an inorganic device. ¶0250 states a speaker or microphone may be added with a wiring pattern 846 (Fig. 17B). None of these components is an active organic component.

In Fig. 17A and ¶0241-0244, no circuit board is described. What is described is a battery, the power source, and shown comprising layer 829a, a positive battery electrode, layer 929b an electrolytic film, and layer 829c, a negative battery electrode. Neither electrode is shown as forming a conductive track for an inorqanic semiconductor electrical component as claimed, but merely are electrodes of a battery. The components, ICs 842 and 843, are on one surface of bottom insulation layer 833 and on whose opposite surface is disposed a copper foil 834 that forms a negative electrode layer 829c of the battery. The bottom layer 833 is not a circuit board, since it is part of a laminated structure as shown in Fig. 17A. Such a layer does not include an active organic electronic component electrically integrated on the surface with others of the interconnected devices to form at least a portion of an electrical circuit and having a conductor track on which is an inorganic component, as claimed. All of these components have to be on the same board surface. This is not true for the structure of Fig. 17A.

The battery is on one surface of the layer 833 and the chips 842 and 843 are on another different opposite surface. The paragraph referring to the transistor of Fig. 4C does not show where in Fig. 17A such a transistor is or should be located, or for that matter in any other figure, notwithstanding no circuit board is shown or described, and for what purpose that transistor serves. It certainly is not shown on a surface of bottom layer 833, which is not a circuit board as explained. This figure teaches away from claim 1, the antithesis of obviousness much less anticipation.

The layer of Fig. 4E, ¶0154, can not be construed to be a circuit board, not withstanding that there is no active organic component on this layer as claimed in claim 1. There is a driver/control circuit 28, a power source layer 27 and a communication circuit 29. In Fig. 4E, the driver circuit region, control circuit region and communication circuit region are formed in the same layer. However, this layer is part of a larger laminated structure. The driver/control circuit 28 is for the display layer, ¶0154, lines 2 and 3. This display layer is not shown in Figs. 4D and 4E, but is contemplated as being required for both of these figures. The first sentence of ¶0154 refers specifically to Figs. 4D and 4E. Therefore, both of these figures are only partial drawings of the assembly forming the display structure, which structure is extensively described in others of the figures, and in particular, see Fig. 1A.

It is plain that the disclosure in ¶0154 is referring to laminated multiple layer structures as depicted in Fig. 1A among other figures, wherein there is a base layer 11, an electric layer 14 and a display layer 12, for example. Specifically, Fig. 1A layer 14 is described as comprising a power source, a drive circuit, a control circuit, a communication circuit and an acoustic conversion element, ¶0083. Therefore, the Fig. 4E embodiment contemplates that the control circuit, drive circuit and communication circuit, while formed in one electric layer, is part of a larger laminated structure including a base layer and a display layer. As such, the combination does not form a circuit board and the embodiment of Fig. 4E can not be construed as a circuit board due to the

laminated configuration of Fig. 1A, among other figures, of which the electric layer of Fig. 4E is but one piece.

The Action states that at least one electrode layer of the integrated active organic electronic component forms a conductive track layer (16d of Figures 3C or 3D) of a base plate for a conventional semiconductor component. (referring to page 8, para 148, 1st sentence and para 149). But Fig. 3C shows openings 16f in the layer 16d and a plurality of interconnected laminated electrical layers, ¶0149, and not a circuit board. Lower wiring 16a is connected to upper wiring 16b. Fig. 3C. Fig. 3D shows a conventional semiconductor chip 16s disposed on layer 16d. A wiring pattern is disclosed which is referred to as an organic electronic component in Figs. 3C or 3D or in ¶0148 or ¶0149. ¶0148 first sentence merely refers to Fig. 4D, a stacked arrangement and not a circuit board as claimed. Support is not seen in the figures or text for the conclusion that there is at least one electrode layer of an integrated active organic electronic component disclosed in these paragraphs or figures on which an inorganic component is mounted. No such active organic electronic component with the inorganic component as claimed is shown. Fig. 4E is discussed above and also is not relevant to claim 1.

In ¶ 0148, there is a statement that organic semiconductor transistors are in each circuit layer. This statement has no supporting disclosure in any of the figures and accompanying text as to what the transistors do and how they are interconnected, if at all and to what elements. More importantly, none of the figures show or describe a

circuit board, so the use of such a transistor therewith is of no consequence. The so called electric layers of Fig. 1A through Fig. 4F merely show stacked layers attached thereto and a general discussion of inorganic driver, power source, control circuit or communication IC circuits as discussed above. The only specific disclosure of such chip IC elements are in Fig. 17A, which does not show an organic transistor in any of these circuits. Thus, there is no enabling disclosure in this reference of an organic transistor utilized with a circuit board or the circuits disclosed especially in view of Fig. 17A as discussed above as claimed.

In Fig. 4E, as in all of the other figures, only stacked arrangements or non-relevant display elements in combination with such stacked arrangements is shown. Fig. 4E is not relevant as no organic devices are disclosed used in this figure, only inorganic ICs (Fig. 17A), notwithstanding this layer is stacked as shown in Fig. 1A for example as a laminated layer. The remaining reference cited of record is equally foreign to amended claim 1. This claim is believed allowable.

Claim 2 presents the invention in somewhat different form and also is not shown, suggested or disclosed in the Hayashi reference.

This claim calls for:

> a circuit board defining a surface ; and
> at least one active organic electrical component and at least one passive organic electrical component electrically interconnected and integrated to form at least a portion of an electrical circuit on the surface .

Thus the claim calls for a circuit board and at least one active organic electrical component and at least one passive organic electrical component electrically interconnected and on the surface of the board. This requires two organic elements, one active and one passive interconnected to form at least a portion of an electrical circuit and both are on the same surface of a circuit board. No circuit board is shown in Hayashi as discussed above.

As to this claim, the Action states that Hayashi discloses a substrate and at least one active organic component at page 8, ¶0147 and at least one passive organic component page 8, ¶0147. But such a substrate is not a circuit board as now claimed. This reference does not disclose a circuit board as one of ordinary skill in the art would construe this term. The reference discloses various laminated layers. But such layers would not be reasonably construed as a circuit board by one of ordinary skill. Applicants also disagree as to any conclusion that the reference discloses passive and active organic components integrated on a circuit board. Such are not disclosed in the various figures.

The Action refers to page 8, ¶0147 for the disclosure of at least one active organic component Fig. 4c and at least one passive component, page 8, ¶0149, 2nd last sentence, integrated on the substrate. But as indicated above, a circuit board not disclosed is claimed. ¶0147 Fig. 4C discloses an organic transistor, but no circuit board is disclosed in this figure. ¶0149, 2nd last sentence, states that the wiring is made of organic conductive material or the like. This is in connection with figure 3C. But Fig.

3C is not a circuit board. The wiring and insulating layer are laminated layers. See the first sentence of ¶0149 which states that this figure shows the electric connection of a plurality of laminated electric layers. Plainly, laminated electric layers do not make a circuit board as claimed on whose surface the components are placed. To place the transistor of Fig. 4C on the layer 16d of Fig. 3C does not produce a circuit board as claimed, but a laminated stacked structure as disclosed. This is not what is claimed. No passive organic elements in combination with an active organic element on a circuit board as claimed are disclosed in this reference. Careful review of the remainder of this reference discloses no such passive and active elements on a surface of a circuit board as claimed. Laminated electrical structures do not form such a circuit board. For these reasons, claim 2 amended is believed allowable.

The remaining claims depend from the independent claims, and are believed allowable at least for the same reasons.

Since claim 1-21 have been shown to be in proper form for allowance, such action is respectively requested.

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